Lunar Plants Prototype for Moon Express

Completed Technology Project (2012 - 2012)

Project Introduction

The goal of our project is to bring the first full life cycle to the moon: to demonstrate germination of plants in lunar gravity and radiation.

The Moon Express Google Lunar X-Prize flight will bring the first-ever resident life to the moon: Lunar Plants. We will place a small, self-contained plant payload on Moon Express's upper deck. The plant module will contain a habitat with dry seeds and subsystems to generate power, provide water, and communicate imagery to Moon Express' control module. After landing on the moon, an internal timer will trigger the micro-fluidics system to release water into the seeds. 100 seeds will germinate and send sprouts into the sunlight. Solar concentrators and photovoltaic cells will filter the wavelengths needed by the sprouts, using the remainder to power the habitat. A camera will snap photos of the sprouts, and send them to Moon Express's downlink via a wireless communications system. Moon Express may point one of their cameras at our habitat as a secondary image capture. Daily photos will show the first life to put down roots on the moon. One hundred seeds may germinate in a habitat the size of a coke can. Image return contains all the science data needed to determine growth patterns, temperature, coriolis effects, and radiation effects over one lunar day.

Anticipated Benefits

We have developed ties with Space Biology at NASA Headquarters and anticipate their continued encouragement of our work. We have collaborated with members of KSC's Life Support Group for plant growth and anticipate they will be Co-I's for our follow-on funding.

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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Ames Research Center (ARC)

Responsible Program:

Center Innovation Fund: ARC CIF

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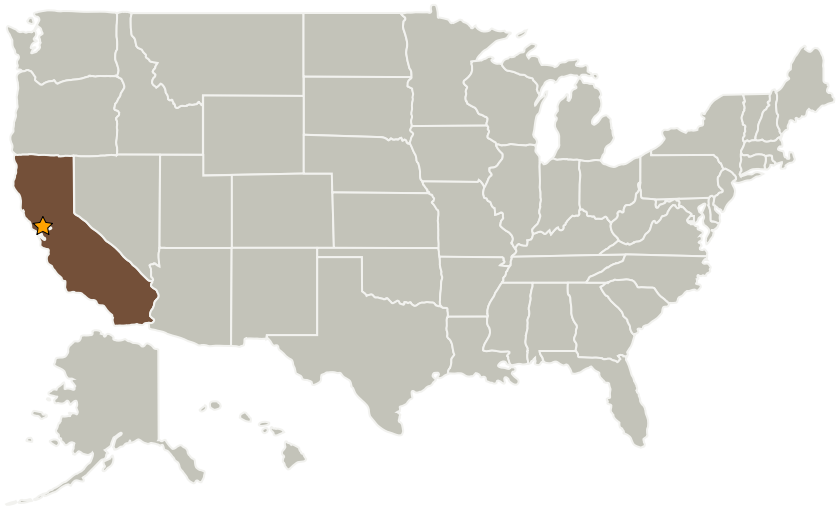
Primary U.S. Work Locations and Key Partners



Organizations Performing Work	Role	Type	Location
★Ames Research Center(ARC)	Lead Organization	NASA Center	Moffett Field, California

Primary U.S. Work Locations
California

Stories

1676 Approval #17536
(https://techport.nasa.gov/file/8741)

Project Management

Program Director:
Michael R Lapointe

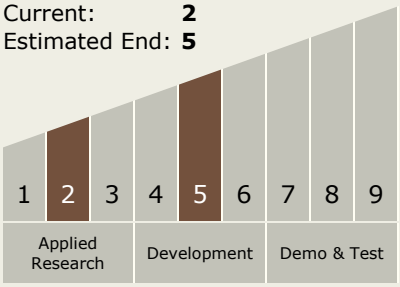
Program Manager:
Harry Partridge

Project Manager:
Chris Mckay

Principal Investigator:
Chris Mckay

Technology Maturity (TRL)

Start: **2**
Current: **2**
Estimated End: **5**



Technology Areas

Primary:

- TX07 Exploration Destination Systems
  - TX07.1 In-Situ Resource Utilization
    - TX07.1.2 Resource Acquisition, Isolation, and Preparation